

Evaluation of *Beta* PIs from the USDA-ARS NPGS for resistance to curly top virus, 2001.

Thirty Plant Introductions (PIs) from the USDA-ARS National Plant Germplasm System (NPGS) (garden beet, sugar beet, leaf beet, fodder beet, and wild beet) were evaluated for resistance to the beet curly top virus in an artificially inoculated nursery, managed by the Beet Sugar Development Foundation in Kimberly, ID. The field was planted on 11 through 12 Jun. Planting was late to maximize the number of viruliferous leafhoppers available to transfer to the sugar beets while they are in the 8- to 10-leaf stage. Plots consisted of two, 12-ft long rows with a 22 in. between-row spacing. Plots were replicated twice. After the beets emerged, rows were trimmed to a length of 8ft and thinned to an in-row spacing of one foot, and cultivated. Viruliferous leafhoppers were released on 11 and 12 Jul to cause an artificial epiphytotic. One week before the leafhoppers were released in the nursery, they had been transferred onto curly topinfested beets to assure that they were viruliferous when placed in the field. Uniform infection was achieved by placing approximately 100,000 leafhoppers uniformly throughout the field and then spreading the leafhoppers daily for the next week by dragging a 12-foot tarp across the field. The field was sprayed 1 Aug to kill the leafhoppers.

Plots were visually evaluated and rated on a Disease Index (DI) scale of 0 to 9 (no symptoms to dead) on 17 Aug and 31 Aug. An analysis of variance (PROC GLM - SAS) on the disease indices (visual evaluation scores) determined that there were highly significant differences ($P = 0.05$) among entries on both dates. The LSD was calculated using two as the number of replications. The summer was very hot and dry and the epiphytotic extremely severe, thus ratings were taken earlier than last year (17 Aug, 2001 for first reading as opposed to 22 Aug, 2000). There were 23 accessions which were not significantly different from the resistant control at the first rating period, 14 of which were not significantly different at the second rating as well. An additional accession was not significantly different from the resistant control only at the second rating. We would like to express our appreciation to the Beet Sugar Development Foundation that funded this research trial and to Mr. Terry Brown of the BSDF, who managed the nursery and helped with the evaluations. These data, and more information on the accessions evaluated, are available through the USDA-ARS GRIN database at <http://www.ars-grin.gov/npgs>.

| Entry | Identification | Donor's ID | Disease Index* | |
|-------------|----------------|-----------------------------------|----------------|--------|
| | | | 17 Aug | 31 Aug |
| 1 | PI 540609 | WB 863..... | 5.5 | 5.5 |
| 2 | PI 540619 | WB 873..... | 5.5 | 6.5 |
| 3 | PI 540647 | WB 901..... | 4.0 | 5.0 |
| 4 | PI 540654 | WB 908..... | 5.0 | 6.5 |
| 5 | Ames 3096 | IDBBNR 4828..... | 6.0 | 6.5 |
| 6 | Ames 8280 | IDBBNR 9497..... | 6.0 | 5.5 |
| 7 | Ames 19022 | IDBBNR 9554..... | 7.5 | 8.0 |
| 8 | Ames 19158 | Kyzyl-ca..... | 6.0 | 6.5 |
| 9 | Ames 19160 | Adanskaja Zeltaja..... | 8.0** | 8.0** |
| 10 | Ames 19161 | Alasehirskaia..... | 6.0 | 6.0 |
| 11 | Ames 19162 | Abhazskaja Zelenaja..... | 6.0 | 7.0 |
| 12 | PI 612770 | EL 40..... | 6.5 | 8.0 |
| 13 | PI 504262 | Wild Beet..... | 6.5 | 6.5 |
| 14 | PI 518306 | IDBBNR 5800..... | 4.0 | 4.0 |
| 15 | PI 531254 | Kawemaja..... | 6.5 | 7.0 |
| 16 | PI 540676 | WB 930..... | 4.0 | 4.0 |
| 17 | PI 540606 | WB 860..... | 6.5 | 7.5 |
| 18 | PI 540608 | WB 862..... | 4.0 | 5.0 |
| 19 | PI 540613 | WB 867..... | 4.0 | 5.0 |
| 20 | PI 540616 | WB 870..... | 5.0 | 5.5 |
| 21 | PI 540617 | WB 871..... | 6.5 | 7.0 |
| 22 | PI 540629 | WB 883..... | 4.0 | 5.5 |
| 23 | PI 540631 | WB 885..... | 6.0 | 6.5 |
| 24 | PI 540645 | WB 899..... | 4.0 | 5.0 |
| 25 | PI 540649 | WB 903..... | 5.0 | 5.0 |
| 26 | PI 540651 | WB 905..... | 6.5 | 5.0 |
| 27 | PI 540653 | WB 907..... | 5.0 | 6.5 |
| 28 | PI 540656 | WB 910..... | 6.0 | 5.0 |
| 29 | PI 540657 | WB 911..... | 5.0 | 5.0 |
| 30 | PI 540658 | WB 912..... | 5.0 | 4.5 |
| 31 | 96A008 | Beta G6040 - Resistant Check..... | 4.5 | 4.0 |
| 32 | 911032 | FC718 - Susceptible Check..... | 6.5 | 6.5 |
| LSD(0.05)** | | | 1.74 | 1.75 |

*Disease Index (DI) scale = 0 (no symptoms) to 9 (plant death).

**There were missing plots for this accessions; the LSD was generated using 2 replications, which makes this an inappropriate comparison statistic for these accessions to the control.